B.Sc Life Science, IInd Year, Major paper Paper-I.

Part A- Introduction				
Program: Certificate		Class: B.Sc	Year: 2nd Year	Session: 2022 – 2023
Subject: Life Science				
1	Course Code	S2 LFSC 1T		
2	Course Title	Plant and Animal physiology (Major Paper)		
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	CORE		
4	Pre-requisite (if any)	This course can be opted as an elective by the students of Life Sciences		
5	Course Learning outcomes (CLO)	After studying this course, students will be acquainted with the basic physiological processes both in animal and in plant systems		
6	Credit Value (T+P)	4		
7	Total Marks	Max. Marks: 30 +70	Min. Passing Marks: 33	

Part B- Content of the Course			
Total No. of Lectures: 60 L-T-P:			
Unit	Topics	No. of Lectures	No of Tutorial
1	Plant Water Relations: Absorption of water, transpiration, ascent of sap. Stomata: Mechanism of stomatal movement. Photosynthesis: Photosynthetic apparatus and photosynthetic pigments. Photochemical reactions: Electron transport chain, Photophosphorylation, Calvin cycle, Carbon fixation in C_3 and C_4 plants. Factors	12	

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	affecting photosynthesis		
2	Respiration: Glycolysis, TCA cycle, Electron transport in Mitochondria, Pentose phosphate pathway. Nitrogen metabolism: Biological nitrogen fixation. Nitrate reduction and its regulation. Ammonia assimilation. Elementary idea of *nif* genes and role of leghaemoglobin.	12	
3	Digestive system of mammals: Structure and function; Digestion and absorption of Carbohydrates, Lipids and Proteins. Secretory function of alimentary canal. Excretory System of Mammals: Structure and function, Formation of urea (Ornithine cycle) and Urine (Glomerular filtration, Tubular secretion and Selective re-absorption)	12	
4	Respiratory system of mammals: Morphology of respiratory organs. Mechanism of respiration, transport of oxygen and carbon dioxide by blood. Circulatory system of mammals: Course of blood circulation. Composition of blood and its functions. Mechanism of blood clotting.	12	
5	Muscular system of mammals: Types of muscles; their structure and function. Mechanism of muscle contraction. Nervous system of mammals: Structure of nervous tissue (neurons, nerve fibres and neuroglial cells). Mechanism of nerve impulse transmission, reflex action and neuromuscular junctions	12	

Key words/Tags: Animal Physiology and Plant physiology

Part C-Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

List of Books

1. Modern Plant Physiology- Sinha, R.K. Narosa Publishing House.
2. Textbook of Plant Physiology - Verma V., Ane books Publishers

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3. An Introduction to Plant Anatomy-B.P. Pandey, S.Chand Publications.

4. Morphology and Evolution of Vascular Plants- Gfford, E.M. and Foster, A.S., Freeman & Co.
5. Introductio to Plant Physiology- Hopkins W.G. John Wiley & Sons. N.Y.

6.Chordate Zoology and Elements of Animal Physiology, By Jaurdan, E.L. and Verma, P.S., S. Chand & Company Ltd, New Delhi.

7. *Animal Physiology & Biochemistry*, by H.R. Singh & Neeraj Kumar , Rastogi Publications, Meerut - 250 002 U.P. India
8. Introduction to plant tissue culture-(for undergraduate) M.K. Razdan

2. Suggestive digital platforms web links

Suggested equivalent online courses:

https://www.youtube.com/watch?v=eAfvc5DGgNM

https://onlinecourses.nptel.ac.in/noc20_bt42/preview

Part D-Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks : 100

Continuous Comprehensive Evaluation (CCE) : 30marks & University Exam (UE) 70 marks

Internal Assessment : Continuous Comprehensive Evaluation (CCE):30	Class Test Assignment/Presentation	15 15 Total Marks: 30
External Assessment : University Exam Section: 70 Time : 02.00 Hours	**Section(A)** : Three Very Short Questions (50 Words Each) **Section (B) :** Four Short Questions (200 Words Each) **Section (C) :** Two Long Questions (500 Words Each)	03 x 04 = 12 04 x 07 = 28 02 x 15 = 30 Total marks: 70

Any remarks/ suggestions:

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BSc Life Science IInd Year minor paper Paper II

Part A Introduction			
Program: Certificate	Class: B.Sc	Year: 2nd Year	Session: 2022 – 2023
Subject: Life Science			

1	Course Code	S2 LFSC 2T
2	Course Title	Growth and Development in Plants and Animals (Minor Paper)
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Generic elective
4	Pre-requisite (if any)	This course can be opted as an elective by all the students
5	Course Learning outcomes (CLO)	After studying this course, students will be able to understand the basic growth and development process both in animal and plant systems
6	Credit Value (T+P)	4
7	Total Marks	Max. Marks: 30 + 70 / Min. Passing Marks: 33

Part B- Content of the Course

Total No. of Lectures: 60

L-T-P:

Unit	Topics	No. of Lectures	No of Tutorial
1	**Cell Cycle:** Overview of Cell cycle: Role of Cell division; Molecular controls in cell cycle: Regulatory Checkpoints, Totipotency, Cell synchrony Cell differentiation, Cell senescence, concepts in Stem Cells and	12	

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	Cloning, Cancer, Discovery of Oncogenes, Mechanism of Oncogene Activation,		
2	Reproductive system of mammals: Structure of male and female reproductive organs. Female reproductive cycles (Menstrual cycle and oestrous cycle). Gametogenesis (Spermatogenesis and Oogenesis). Fertilization; mechanism of fertilization and its significance.	12	
3	Endocrine system of mammals: Outlines of different mammalian hormones. Structure and function of pituitary gland. Function of hypothalamus. Structure and function of thyroid gland. Hypothyroidism. Structure and function of Pancreas, Diabetes mellitus.	12	
4	Growth and development in plants : Structure and functions of growth regulators. (Auxins, Cytokinins, Gibberelins, Ethylene and Abscicic acid).Concept of photoperiodism and vernalization. General idea of phytochrome. Plant movements: Autonomic or spontaneous movements, paratonic or inducedmovements	12	
5	Morphology of flower. Microsporogenesis, Megasporogenesis, Pollination. Fertilization. Embryo, Endosperm. Secondary growth in dicotyledons. Introduction to Plant tissue culture , media, Initiation of callus, isolation of single cells, Suspension cultures, Cytodiffertiation , Organogenic differtiation, Somatic embryogenesis.	12	

Keywords/Tags: Development in Animal and Plant

Part C-Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

1.Plant Physiology- Padey & Sinha, Vikas Publishing House.
2.Plant Physiology- Salisbury and Ross, C.W., Wadsworth Pub. Co. Calofornia.

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Text Books, Reference Books, Other resources
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Suggested equivalent online courses: https://onlinecourses.swayam2.ac.in/cec20_bt21/preview http://www.digimat.in/nptel/courses/video/102108086/L01.html https://onlinecourses.nptel.ac.in/noc20_bt36/preview
Part D-Assessment and Evaluation
Suggested Continuous Evaluation Methods: Maximum Marks : 100 Continuous Comprehensive Evaluation (CCE) : 30marks University Exam (UE) 70 marks

Internal Assessment : Continuous Comprehensive Evaluation (CCE):30	Class Test Assignment/Presentation	15 15 Total Marks: 30

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External Assessment : University Exam Section: 70 Time : 02.00 Hours	**Section(A)** : Three Very Short Questions (50 Words Each) **Section (B) :** Four Short Questions (200 Words Each) **Section (C) :** Two Long Questions (500 Words Each)	03 x 04 = 12 04 x 07 = 28 02 x 15 = 30 Total marks: 70
Any remarks/ suggestions:		

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Format for Syllabus of Practical Paper

Part A Introduction			
Program: Diploma	Class`:B.Sc	Year: Second	Session:2022-2023
Subject: Life Science			

1	Course Code	S2LFSC1R
2	Course Title	Practicals Plant and Animal Physiology
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	core
4	Pre-requisite (if any)	For life Science
5	Course Learning outcomes (CLO)	On completion of this course, learners will be able to: Understand the role and significance physiological process in animal and plants
6	Credit Value	2
7	Total Marks	Max. Marks: 30+70 / Min. Passing Marks:33

Part B- Content of the Course

Total No. of Lectures-Tutorials-Practical (in hours per week):

L-T-P:

Unit	Topics	No. of Lectures
1`	Study and comments on the histological slides and charts /models related to Digestive system, Excretory system, Respiratory system, Nervous system, Circulatory system in mammals	
2	1. Hematological Experiments : (a) Blood grouping (b) RBC total count (c) WBC total count (d) WBC differential count	

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	(e) Estimation of Hemoglobin (f) Clotting time and bleeding time.	
3	Absorption spectra of chlorophylls.	
4	Separation and identification of plant pigments by paper chromatography.	
5	Isolation of viable chloroplast from spinach and demonstration of hill activity.	
6	Study of Plasmolysis and Deplasmolysis using *Tradescantia* peel.	
7	To study the relative rates of water-vapour loss (transpiration) from the leaf surfaces of different plants	
8		
9		
10		
11		

Keywords/Tags: **Animal and Plant Physiology**

Part C-Learning Resources

Text Books, Reference Books, Other resources

Suggested Reading Experiments in Biotechnology - Anand Nighoj kar, Sadhna Nighojkar ISCA Publications.

Techniques in Biotechnology - Ashish Verma.

Suggested equivalent online courses:

Part D-Assessment and Evaluation

Suggested Continuous Evaluation Methods:

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Internal Assessment	Marks	External Assessment	Marks
Class Interaction /Quiz	15	Viva Voce on Practical	10
Attendance	5	Practical Record File	10
Assignments (Charts/ Model Seminar / Rural Service/ Technology Dissemination/ Report of Excursion/ Lab Visits/ Survey / Industrial visit)	10	Table work / Experiments	50
TOTAL	30		70

Any remarks/ suggestions:

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Format for Syllabus of Practical Paper

Part A Introduction			
Program: Diploma	Class`:B.Sc	Year: Second	Session:2022-2023
Subject: Life Science			
1	Course Code	S2LFSC2R	
2	Course Title	Practicals Plant and Animal Growth and Development	
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	minor	
4	Pre-requisite (if any)	For life Science	
5	Course Learning outcomes (CLO)	On completion of this course, learners will be able to: Understand the role and significance of growth process in animal and plants	
6	Credit Value	2	
7	Total Marks	Max. Marks: 30+70	Min. Passing Marks:33

Part B- Content of the Course

Total No. of Lectures-Tutorials-Practical (in hours per week):

L-T-P:

Unit	Topics	No. of Lectures
1	Study and comments on the histological slides and charts /models related to Reproductive System, Endocrine System, Stem Cells and Cancer.	
2	To study cell division in onion root tips.	

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3	To study the Plant Cell structure using various plant materials.	
~~4~~	~~Perform histological study of Root , Stem, and Leaf for identification of monocotyledons and dicotyledons plant systems~~ Study various stages of monocot and dicot embryo	
5	Study of floral organs representation of floral parts by floral diagram, and floral formulae	
6	Effect of Auxins ,Cytokinins and Giberellins in plant growth	
7	Study of developmental stages of chick embryo	
8	Effect of temperature on cell permeability in plant cell.	
9	Localization of polysaccharide in plant tissue using Schiff's reagent	
10	To demonstrate the occurrence of transfer cells and tracheary element	
11	Establishment of primary culture from different explants.	

Keywords/Tags: **Animal and Plant Physiology**

Part C-Learning Resources

Text Books, Reference Books, Other resources

Suggested Reading Practicals in Botany - Bendre & Kumar.

Suggested equivalent online courses:

Part D-Assessment and Evaluation

Suggested Continuous Evaluation Methods:

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Internal Assessment	Marks	External Assessment	Marks
Class Interaction /Quiz	15	Viva Voce on Practical	10
Attendance	5	Practical Record File	10
Assignments (Charts/ Model Seminar / Rural Service/ Technology Dissemination/ Report of Excursion/ Lab Visits/ Survey / Industrial visit)	10	Table work / Experiments	50
TOTAL	30		70

Any remarks/ suggestions:

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